

# Balanitis Xerotica Obliterans and Its Differential Diagnosis

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**Background:** Balanitis xerotica obliterans is a subcategory of lichen sclerosus et atrophicus limited to the male genitalia and is associated with destructive inflammation, phimosis, urethral stenosis, and squamous cell carcinoma.

**Methods:** The medical literature was searched from 1983–1998 using key words balanitis, lichen, and sclerosis using the MEDLINE system.

**Results and Conclusions:** Balanitis xerotica obliterans can be distinguished from other genital dermatoses with similar characteristics through patient history, clinical findings, and laboratory evaluation. Tzanck smear and cutaneous biopsy, along with a rapid protein reagent test, will provide a definitive diagnosis. Treatment with high-dose topical corticosteroids relieves symptoms, and therapy focuses on prevention of disease progression (J Am Board Fam Pract 1999;12:473–6.)

Balanitis xerotica obliterans is a subcategory of lichen sclerosus et atrophicus limited to the male genitalia.<sup>1</sup> It is associated with destructive inflammation, phimosis, urethral stenosis, and squamous cell carcinoma. Balanitis xerotica obliterans will often be a diagnostic challenge because of the broad differential diagnosis of genital dermatoses with similar characteristics.

## Methods

We describe a case of balanitis xerotica obliterans in a 26-year-old man. The clinical findings of balanitis xerotica obliterans can provide for a differential diagnosis to include infectious, rheumatic, reactive and neoplastic etiologies. A discussion of the history, symptoms, physical examination, and laboratory elements that aid in diagnosis is presented. Treatment options and preventive measures are addressed. MEDLINE was searched from 1983–1998 using key words balanitis, lichen, and sclerosis.

## Case Report

A 26-year-old man was referred to the dermatology clinic for evaluation of penile lesions. He stated that areas of lighter skin on the glans and foreskin had been increasing in size during the last 2 to 3

years and recounted a several year history of pruritus. Erections were associated with fissuring of the glans and shallow erosions along the foreskin. The patient was taking no medications, including laxatives or anti-inflammatory agents. The patient's medical history was noncontributory. His sexual history was negative for sexually transmitted diseases and anal receptive intercourse. He was currently involved in a heterosexual, monogamous relationship and did not use condoms. He had a lifetime history of fewer than four sexual partners. A review of symptoms was pertinent for a lack of headache, malaise, myalgias, arthralgias, or eye complaints. The patient's initial reason for seeking care was prompted by concerns of a possible herpes infection and the start of a new relationship.

On retraction of the foreskin, a discrete, white, slightly depressed 1.3-cm patch was visible on the left glans, which extended to the edge of the meatus. (Figure 1) The foreskin was thickened, and there were 2-mm to 3-mm atrophic, confluent, macules. No erosions, vesicles, hyperpigmented plaques, or inguinal adenopathy were observed.

Histologic examination of a cutaneous biopsy of foreskin confirmed the diagnosis of balanitis xerotica obliterans. Therapy consisted of 0.05% clobetasol ointment applied to the glans and foreskin, initially twice daily for 3 weeks, then once every other day. The patient's symptoms of pruritus, fissuring, and erosions resolved within 7 days. A recommendation for circumcision was made, but the patient declined the procedure.

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**Figure 1. Balanitis xerotica obliterans.** Well-defined, hypopigmented patch on the distal glans. Sclerotic process extends to urethral meatus with mild erythema of urethral os. Multiple hypopigmented macules, coalescing into plaques, are present on retracted foreskin.

## Discussion

Balanitis xerotica obliterans is a chronic, sclerotic dermatitis involving the genital skin of men. When it occurs at sites other than the penis, it is called lichen sclerosus et atrophicus. Clinically, patients with balanitis xerotica obliterans develop discrete, angular, white, atrophic macules and patches on the glans, prepuce, and foreskin of the penis, with only rare involvement of the shaft. The prepuce is often thickened, and fissures and erosions appear over the glans. Because the atrophic sclerotic lesions can be quite sensitive to trauma, bullae, shallow erosions, and bleeding are sometimes observed. Phimosis, the inability to retract the foreskin over the corona of the penis, and paraphimosis, the inability to extend the foreskin over the glans, are potential sequelae. Balanitis xerotica obliterans is found most commonly in patients aged between 15 to 50 years who are uncircumcised or who had circumcisions later in life. It tends to progress slowly and insidiously for an extended period and can be accompanied by pruritus, tenderness, painful erections, dysesthesia, dysuria, and a reduction in the force of urine flow.

These symptoms can be quite troubling for a patient and often prompt his visit for medical attention. Despite considerable clinical transformation and damage, however, some patients can remain asymptomatic.

Although the cause of balanitis xerotica obliterans is unknown, autoimmune, hormonal, keratin,

collagenase, elastase, and genetic factors are all implicated. Balanitis xerotica obliterans is diagnosed definitively by histologic evaluation of a cutaneous biopsy. Affected tissues display variable hyperkeratosis, parakeratosis, epidermal atrophy, liquefaction, degeneration of the basal layer, flattening of the rete pegs, homogenization of collagen in the dermis, and a sparse dermal mononuclear cell infiltrate.

Given the clinical appearance of balanitis xerotica obliterans, the differential diagnosis includes genital herpes, syphilis, fixed drug eruption, vitiligo, Reiter syndrome, squamous cell carcinoma, and erythroplasia of Queyrat. (Table 1)

Genital herpes simplex virus (HSV) infection is a sexually transmitted disease classically described as grouped vesicles on an erythematous base associated with HSV type 2.<sup>2</sup> Vesicles generally range from 2 to 4 mm and are distributed over the glans, prepuce, and shaft. Because the vesicles are fragile, patients infrequently come to their primary care provider with intact lesions; more commonly, the lesions consist of shallow erosions. Primary genital herpes is associated with a severe cutaneous eruption and fever and symptoms of headache, malaise, myalgias, and arthralgias. Recurrent genital herpes infections are generally less severe and might not produce systemic symptoms. A suspected diagnosis of genital herpes infection can be confirmed by the evaluation of a tissue scraping from the base of an erosion, a positive Tzanck smear with multinucleated giant cells, or a positive rapid fluorescent antibody test specific for herpes simplex.

Syphilis is a sexually transmitted disease caused by the spirochete, *Treponema pallidum*. Primary syphilis usually appears at the corona of the penis as a painless chancre consisting of a central ulcer with raised edges. These early lesions generally regress after several weeks. The resolving primary chancre looks like an atrophic macule or patch, mimicking balanitis xerotica obliterans. Syphilis is diagnosed by identifying the spirochete with dark-field microscopy or by serologic studies. Nonspecific serologic tests that use a nontreponemal antigen are the rapid protein reagin test and the VDRL test. As false-positive results occur (most commonly in collagen vascular disease), a specific treponemal antigen test (FTA-Abs) will confirm the diagnosis of syphilis.

A fixed drug eruption is a recurrent allergic reaction to an ingested substance. Both skin and mucous membranes can be involved. In order of

**Table 1. Characteristics of the Differential Diagnosis of Balanitis Xerotica Obliterans.**

Disease	Systemic Symptoms	Extragenital	Cause	Diagnosis
Balanitis xerotica obliterans	No	Occasionally	Unknown	Biopsy
Herpes simplex virus (HSV)	Fever, myalgia, headache, malaise	Yes	HSV type 2, HSV type 1 (less frequently)	Tzanck smear, immunofluorescence, viral culture, biopsy
Syphilis	Splenomegaly, fever, lymphadenopathy	Secondary: palms, soles, trunk, neck	<i>Treponema pallidum</i>	Dark-field microscopy, VDRL or rapid protein reagin followed by FTA Abs
Fixed drug eruption	No	Oral mucosa can be positive or negative	Drugs, phenolphthalein, sulfonamides, tetracycline, ampicillin, nonsteroidal anti-inflammatory medications	History and physical examination
Reiter syndrome	Arthritis, conjunctivitis, fever	Palms and soles	Unknown Association with HLA B27	Clinical findings
Vitiligo	No	Often generalized	Unknown	Biopsy
Erythroplasia of Queyrat	No	No	Possibly human papilloma virus	Biopsy

FTA Abs—treponemal antigen test specific for *Treponema pallidum*. HLA—human leukocyte antigen.

frequency, the genitalia, face, and torso are most commonly involved. A bulla on an erythematous base or a painful erosion can be found during physical examination of active lesions.

As the acute phase of the fixed drug eruption resolves, discrete postinflammatory hyperpigmented macules are typically observed. Fixed drug eruption of the male genitalia is usually confined to the glans. Diagnosis is based on a careful history, in which the lesion reappears in the same location and is associated with ingestion of a drug. The more common medications implicated in fixed drug eruption are phenolphthalein (a laxative agent that has been removed from the US market), barbiturates, sulfonamides, tetracycline, ampicillin, and nonsteroidal anti-inflammatory medications.<sup>3,4</sup>

Vitiligo is depigmentation of the skin resulting from the loss of melanocytes. Genital lesions tend to be located on the penile shaft and are not sclerotic, atrophic, or symptomatic. Diagnosis is often made on the basis of finding other hypopigmented lesions. Balanitis xerotica obliterans can also have extragenital involvement, however, and a complete history and physical examination are essential to find all areas of involvement. For patients with lighter skin tones, a Wood lamp (ultraviolet light) can be used to augment depigmented patches. Additionally, biopsy shows the absence of melanocytes without dermal sclerosis or loss of the rete pegs.

Reiter disease, found almost exclusively in men, is classically associated with the triad of arthritis,

urethritis, and conjunctivitis. Cutaneous manifestations include circinate balanitis (sharply marginated erosions that can involve the glans, foreskin, shaft, and scrotum) and keratoderma blennorrhagicum (psoriatic-like pustular plaques often noted on the palms and soles). Systemic findings, such as fever and malaise, are common. Diagnosis of Reiter disease is predicated on a seronegative asymmetric arthropathy lasting more than 1 month and one or more of the following: urethritis, cervicitis, dysentery, inflammatory eye disease, or mucocutaneous disease. A complete history and physical examination are of paramount importance, as biopsy findings of Reiter disease are often indistinguishable from psoriasis. The development of Reiter disease is strongly associated with urogenital infections caused by a variety of agents in patients who are positive for human leukocyte antigen B27.<sup>5</sup>

Squamous cell carcinoma of the penis and erythroplasia of Queyrat (squamous cell carcinoma in situ of the glans or prepuce) both must be kept in the forefront of any differential diagnosis of penile lesions because of the serious nature of the disease. Characteristically, squamous cell carcinoma appears as a velvety, red, sharply demarcated plaque. The clinical signs can be quite variable, however, and range from white macules to brown verrucous plaques.

Human papillomavirus has been implicated in invasive squamous cell carcinoma and, to an even greater degree, in squamous cell carcinoma in-

situ.<sup>6</sup> Specifically, *Papillomavirus* type 16 is most closely associated with malignant transformation, and research suggests a role for human papillomavirus in the pathogenesis of squamous cell carcinoma. Definitive diagnosis is made by histologic evaluation of a cutaneous biopsy.

### Treatment

Currently there is no curative therapy for balanitis xerotica obliterans. There are, however, many therapeutic options available to limit involvement and relieve symptoms. High-potency topical corticosteroids (ie, clobetasol 0.05% ointment) are shown to be effective in women with lichen sclerosus et atrophicus and are currently the treatment of choice for balanitis xerotica obliterans.<sup>7,8</sup> Alternatively, intralesional corticosteroid injections have been proposed. In cases of urethral involvement and stenosis, meatotomy or urethral dilation might be required. Circumcision can relieve symptoms of phimosis and often results in remission. Alternatively, carbon dioxide laser therapy might be an option should a patient not respond to more conservative treatments.<sup>9-11</sup> Despite the limitations of the current therapeutic options, reports have shown that balanitis xerotica obliterans is usually restricted to those men who had circumcisions later in life, whereas neonatal circumcision appears to prevent the development of this disorder.<sup>12</sup> In addition to symptomatic treatment and preventative measures, patients need regular follow-up visits (every 12 months), because squamous cell carcinoma arising from the lesions of balanitis xerotica obliterans has been reported.<sup>13,14</sup>

### Conclusion

Balanitis xerotica obliterans can be distinguished from most other genital dermatoses that mimic it by a careful history, focused review of symptoms, and physical examination. A Tzanck smear and cutaneous biopsy are office-based procedures that, along with a rapid protein reagin test, will provide a definitive diagnosis. Treatment with high-dose topical corticosteroids is aimed at reducing the inflammatory process. Balanitis xerotica obliterans has been associated with additional genital abnormalities, including phimosis and squamous cell carcinoma. Neonatal circumcision reduces its occurrence.

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